INDEX.

ABSORPTION and fluorescent spectra of the uranium salts, investigation of, 133
— spectra, 134
Accidents, railway, 341, 413
Acetate, uranic, 135
— — anhydrous, 137
Acetates, double, 137
"Acoustics, Treatise on in connection with Ventilation, and an Account of the Modern and Ancient Methods of Heating and Ventilation" (review), 128
Advance of mechanical puddling, 407
Aërophore, ingenious apparatus for the miner, 262
Agates and other siliceous stones, phosphorescent glow shown by, 266
Age of American coals and lignites, 406
Air, compressed, to underground haulage, 120
— fresh, method for the obtaining of in mines, 262
Alarum signals, 419
ALLAN, Prof. W., "Theory of Arches" (review), 531
Alloy, new, 264
Alloys, especially those of copper and tin, researches on, 121
Analysis of Ashantee gold, 409
— — grain gold from a burn at Wanlock, 409
— — idocrase or vesuvian, 411
"Analysis, Quantitative Chemical" (review), 107
Ancient volcanoes of the Highlands, 271
Anglesey, copper ore in, 120
Anhydrous uranic acetate, 137
Annual International Exhibitions, 332
"Animal Locomotion," (review), 237
"Annual Record of Science and Industry for 1872" (review), 111
"Antozone and Ozone; their History and Origin" (review), 116
Antrim, iron mines of, 537
"Appliances, Workshop" (review), 109
Application of compressed air to underground haulage, 120
"Applications of the Spectroscope" (review), 102
ARMSTRONG, H. E., "Introduction to Organic Chemistry" (review), 250
"Art and Science, Year-Book of Facts in" (review), 403
Artificial crystals of metallic antimony, 408
Artillery matériel, British, recent changes in, 40
Ashantee gold, analysis of, 409
Asmanite, study of, 265
ASSELIN, M., glycerin to prevent incrustations in steam-boilers, 419
ATKINSON, E., "Physics, Experimental and Applied, for the Use of Colleges and Schools" (review), 117
Atmosphere, observations on the optical phenomena of the, 34
Atomic matter and luminiferous ether, 180
ALTHAUS, J., "Medical Electricity, Theoretical and Practical, and its Uses in the Treatment of Paralysis, Neuralgia, and other Diseases" (review), 117

BAER, M., memoir of the Caspian Sea, 127
BAIN, A., "Mind and Body; the Theories of their Relation" (review), 113
BAINBRIDGE, E., prevention of colliery explosions, 262
BAIRD, S. F., "Annual Record of Science and Industry for 1872" (review), 111
BAKER, B., "Long Span Bridges" (review), 118
Balsam, preparations in, 273
BARBER, S., observations on the optical phenomena of the atmosphere, 34
BARBIER, M., electric cable against fires, 419
BARLOW, Mr., nature and uses of modern steel, 122
BARNABY, N., designs for ships, 412

Barometric and thermometric observations, method of recording, 119
Battery, theory of, 279
BEARD, T. M., "Legal Responsibility in Old Age" (review), 400
Beds of gypsum, 416
Beer, permanent, manufacture of, 280
BEHRENS, M., spectrum of the opal, 266
BEINS, H., how to transform heat into mechanical power, 418
BELL, Mr., advance of mechanical puddling, 407
BELT, THOMAS, examination of the theories that have been proposed to account for the climate of the Glacial period, 421
Beryls and emeralds, 504
Béton Aggloméré; or Coignet-Béton and the Materials of which it is Made" (review), 112
Better communication in pit-signalling by means of electricity, 262
"Birth of Chemistry" (review), 251
Bismuth, hydrous arsenate of, 410
— metallurgy of, 408
— ore near Meymac, 406
BLACKLEY, C. H., "Experimental Research on the Causes and Nature of Catarrhus Æstivus (Hay-Fever, or Hay-Asthma)" (review), 118
Blast-furnace slag, utilising, 264
— furnaces, consumption of coal in, 263
— — new form of wagon drop for, 542
BLANFORD, W. T., evidence of glacial action in Tropical India, 127
Blocks, concrete, 269
"Body and Mind, the Theories of their Relation" (review), 113
Boilers, 266
— report on, 267
— strength of, 125
BOTTOMLEY, W., eclipsing apparatus at Holywood lighthouse, 541
BONNEY, T. G., "Geology" (review), 532
BRAMWELL, F. J., waste of fuel, 543
Bridges, long-span (review), 118
Brighton and Hove gas works, 268
British artillery matériel, recent changes in, 40
BROWN, R. G. S., "Divine Revelation or Pseudo-Science" (review),
BULLOCK, T. A., "Animal Physiology" (review), 257
Burglar, fire, and other alarms, lectures upon the system of, 133

CAMPBELL, J. F., polar glaciations, 414
CARON, new mode of tempering steel, 122
CASSELBERRY, result of experiments with voltameters, 132
Cat's-eyes, description of, 122
— examination of, 265
Cause of delay to the publication of "Mineral Statistics," 261
Channel tunnel, 272
Chandra, iron deposits of, 263
CHAPPELL, W., "The History of Music" (review), 516
"Chemical Analysis, Quantitative" (review), 107
"Chemistry, Birth of" (review), 251
"Chemistry, Elements of" (review), 252
Chemistry of minerals, 410
Chert and flint implements found in Kent's Cavern, near Torquay, 141
CHERVILLE, M., process for testing the colour of wines, 280
China, coal-fields in, 120
CHURCH, A. H., analysis of Ashantee gold, 409
— — of clean grain gold from a burn at Wanlock, 409
— beryls and emeralds, 504
— analysis of native silver, 410
CLAPP, W. J., description of the coal-cutting machine, 120
Coal and nickel ore in Persia, 406
— consumption of in our blast-furnaces, 263
Coal-cutting by machinery, 262
— machine, description of, 120
— machinery in mines, working of, 119
Coal fields and mining industries of Russia, 538
— — in China, 120
— — of Italy, 538
— — of South Wales, 538
— — of Victoria, 538
— — — — report on, 262
— mechanical arrangements for shipping, 543
— mining, 538
— produce of England, 119
Cockchafers for manure, 548
"Coignet-Béton or Béton Aggloméré, and the Materials of which it is Made" (review), 112
Colliery accidents, prevention of, 119
— explosions, prevention of, 262

Coloured tapers, 280
Comet, Coggia's, 546
Comets' tails, curved appearance of, 508
Composition of the natural compounds of tantalium and niobium, 266
Concrete blocks, 269
Condition of silicon in pig-iron, 408
Conditions under which diamonds are found, 263
"Conservation of Energy" (review), 232
Construction and maintenance of Braye Bray Harbour, 123
Consumption of coal in our blast-furnaces, 263
Contact theory of the battery, 279
Cooke, J. P., jun., mineralogical paper, 409
Copper mines, native, of Lake Superior, 162
— ore in Anglesey, 120
"Correlation of Physical Forces" (review), 524
Corundum, discovery of, 264
— study of, 265
Counterfeit wines, 280
"Creation by Evolution, or Darwinism and Design" (review), 229
Crookes, W., notes of an enquiry into the phenomena called spiritual, 77
Crystals of metallic antimony, artificial, 408
Culley, R. S., "Handbook of Telegraphy" (review), 255
Cunningham, A., investigation of determinants, 212
Cutting sections for the microscope, 417

Dallinger, W. H., life-history of monads, 273
Danvers, F. C., annual international exhibitions, 332
— — economy of fuel, 67
Davidson and King, Trimerellidæ, 415
Davies, T., "Preparation and Mounting Microscopic Objects" (review), 252
"Darwinism and Design, or Creation by Evolution" (review), 229
Davy lamp, method of preventing tampering with, 262
Deane, H., death of, 417
Deep sea sounding, 541
— — thermometer, 277
Denayrouze, M., ingenious apparatus for the miner to obtain fresh air, 262
Deposits of iron ore in Mount Bischoff, 406
Deptford water supply, 267
Diatomaceen typenplatte, 546
Description of horbachite, 123
— of microsommite, 123
"Description of Practical Solid Geometry" (review), 397
Description of stones called cat's-eyes, 122
"Design and Darwinism, or Creation by Evolution" (review), 229
Designs for ships, 412
Determinants, investigation of, 212
Diamonds, conditions under which found, 263
— in South Africa, 272
Diffracted and refracted spectra, relation between, 27
Discovery of corundum, 264
— of fossils, 271
Displacement of the method for obtaining voluntary returns, 261
Dispute about fine lines on test-plate, 131
Distribution of spathic iron ores, 406
"Divine Revelation or Pseudo-Science" (review), 523
Double acetates, 137
Douglas, H., luminiferous ether and atomic matter, 180
Douglas, J., native copper mines of Lake Superior, 162
Drayson, Lieut-Col. A. W., Pole star and the pointers, 285
— on the curved appearance of comets' tails, 508
Dublin water supply, 269
Dunn, E. J., conditions under which diamonds are found, 263

Earthquake and volcanic eruption at Nissiros, 127
Eclipsing apparatus at Holywood Lighthouse, 541
Edgell, A. W., discovery of fossils, 371
Edmunds, R., recent extraordinary oscillations of the waters in Lake Ontario, and on the sea-shores of Peru, Australia, Devonshire, &c., 156
Economical uses and production of fuel, 194
Economy of fuel, 67
— of steam, 268
Effects of heat, 134
"Elementary Treatise on Physics, Experimental and Applied, for the Use of Colleges and Schools" (review), 117

Elasticity of metals, 264
"Elementary Treatise on Steam" (review), 395
"Elements of Chemistry" (review), 252
Electric cable against fires, 419
Electrical vacuum tube, 279
"Electricity and Magnetism" (review), 107
Electricity, better communication in pit-signalling by means of, 262
Electro-magnet whistle for locomotives, 419
"Elements of Metallurgy" (review). 535
Emeralds and beryls, 504
"Energy, Conservation of" (review), 232
"Engineering, Sanitary" (review), 110
English edition of "Revue Universelle des Mines," 264
"English Psychology, Contemporary" (review), 236
Epidote of Sulzbach, optical characters of the, 266
Ettringite, 411
Examination of cat's eyes, 265
— of the theories that have been proposed to account for the climate of the Glacial period, 421
Expansion of substances by heat, 418
"Experimental Enquiry into the Mechanical Properties of Steel" (review), 398
"Experimental Research on the Causes and Nature of Catarrhus Æstivus (Hay-Fever or Hay-Asthma)" (review), 118
Experiments on Swedish steel, 121
— with voltameters, result of, 132
Explosion in collieries, prevention of, 262
Extension of railways between Bristol and Redstock, 126

"FARINACEA and Fruits Proper Food of Man" (review), 239
Felspars, new species of, 265
Fire, burglar, and other alarms, lectures upon the system of, 133
FISCHER, M., examination of cat's eyes, 265
"Fish and Fisheries, United States Commission" (review), 405
FISHBOURNE, Rear-Admiral, "Our Ironclads and Merchant Ships" (review), 396
FISHBOURNE, Rear-Admiral, loss of life at sea, 465
FISHER, O., origin of the estuary of the Fleet, 127
FLEMING, J. A., contact theory of the battery, 279
Flint and chert implements found in Kent's Cavern, near Torquay, 141
FLOWER, W. H., new species of Halitherium, 128
Fluorescent and absorption spectra of the uranium salts, investigation of, 133
Foresite, mineral, 540
Formula for glycerin jelly, 273
Fossil collection guide, 415
FOSTER, P. LE NEVE, jun., coal-fields of Italy, 538
"Fourth Annual Report of the Board of Commissioners of Public Charities of the State of Pennsylvania" (review), 532
FOX, C. B., "Ozone and Antozone; their History and Origin" (review), 116
Freezing microtome, 128
FRITH, Mr., introduction of working coal-cutting machinery in mines, 119
FROUDE, W., useful displacement of weight, of structure, and of propulsive power, 412
"Fruits and Farinacea, the Proper Food of Man" (review), 239
Fuel, economy of, 67
— waste of, 541

GALLOWAY, W., method of recording barometric and thermometric observations, 119
— — prevention of colliery accidents, 119
GALL's discovery of the physiology of the brain, and its reception, 56
Galvanic current entering and leaving a conducting medium, 279
Gas generator, improved forms of, 139
GEIKIE, A., "Geology" (review), 240
GEISSLER, M., electrical vacuum tube, 279
Geological block model of London, 127
— investigation in the neighbourhood of Hallstadt, 128
— record, 271
— Survey of the United Kingdom, 52
"Geology" (review), 240
Geology and parish boundaries, 371
— Professor of at Oxford, 546

Geology of West Coast of Africa, 537
GENTH, F. A., study of corundum, 265
GILLMORE, C. A., "Béton Aggloméré, or Coignet-Béton, and the Materials of which it is Made" (review), 112
— — "Practical Treatise on Limes, Hydraulic Cements, and Mortars" (review), 112
Glacial action in Tropical India, 127
— period, theories to account for the climate of, 421
Glaciation, polar, 414
Glycerin to prevent incrustations in steam boilers, 419
GODDARD, T. M., better communication in pit-signalling by means of electricity, 262
— — method of preventing tampering with the Davy lamp, 262
Gold-fields of Victoria, 539
GOODEVE, T. M., "Principles of Mechanics" (review), 534
GOSSE, P. H., "Evenings at the Microscope" (review), 254
Great Basses lighthouse, 270
Grochauite, new species of clinochlore, 410
GROVE, Sir W. R., "The Correlation of Physical Forces" (review), 524
Guns, 411
GUTHRIE, F., galvanic current entering and leaving a conducting medium, 279

HAAS and ROHRIG, iron ores in Bidasoa, 120
Habits of the "plantain eaters," 132
HAILES, H. F., sand blast, 273
"Half-Hours with the Microscope" (review), 253
"Handbook of Natural Philosophy" (review), 531
"Handbook of Telegraphy" (review), 255
Halitherium, new species of, 128
"Harveian Oration for 1874" (review), 522
"Hay-Fever, Causes and Nature" (review), 118
HAYWOOD, street pavements, 268
Heat, 274, 418
— effects of, 134
Helioscope, new, 546
HERSCHEL and G. A. LEBOUR, experiments on the conducting power for heat of certain rocks, 127
Highlands, ancient volcanoes of, 271
"History of Music" (review), 516
History of Rhine Valley, 415
HOLLEY, A. L., tests of metals, 264
Horbachite, description of, 123
HUGHES, T., iron deposits of Chandra, in the Central Provinces, 263
HUNT, R., our tin trade and tin production, 539
"Hydraulic Cements, Mortars, and Limes, Practical Treatise on" (review), 112

ILLINOIS and Iowa tornado, 339
Improved forms of gas generator, 139
Improvement in photo-lithography, 380
— of the water supply of Paris, 124
"Industry and Science, Annual Record of" (review), 111, 398
International exhibitions, annual, 332
Intervals between trains, 413
"Introduction to Organic Chemistry" (review), 250
Investigation of determinants, 212
— of the fluorescent and absorption spectra of the uranium salts, 133
Iowa and Illinois tornado, 339
Iradescantia virginica, 567
Iron-deposits of Chandra, in the Central Provinces, 263
Iron, CRAMPTON'S revolving furnace for puddling, 539
— mines of Antrim, 537
— molecular changes produced in by variations of temperature, 264
— ore, deposits of at Mount Bischoff, 406
— ores in Bidasoa, 170
— remarks on, 408

JEANS, J. S., coal-cutting by machinery, 262
JENKIN, F., "Electricity and Magnetism" (review), 107
JENKS, Col., discovery of corundum, 264
JOHN, W., strength of iron ships, 412
JORDAN, W. L., "The Ocean" (review), 246
JUDD, J. W., ancient volcanoes of the Highlands, 271

KINAHAN, G. H., peat bogs, 294
— water basin of Lough Derg, 127
KING and DAVIDSON, Trimerellidæ, 415

KITTON, F., "Half-Hours with the Microscope" (review), 253
KLEIN, C., optical characters of the epidote of Sulzbach, 266
KIRKALDY, D., experiments on Swedish steel, 121
— "Experimental Enquiry into the Mechanical Properties of Steel" (review), 398
KNOP, Dr., description of horbachite, 123
KNOWLES, H., method of converting cast-iron into malleable iron or steel, 122

LAKE basins, origin of, 271
LARDNER, D., "Handbook of Natural Philosophy" (review), 531
LATHAM, B., "Sanitary Engineering" (review), 110
LAWRENCE, J., remarks on iron, 408
LEBOUR, G. A., and HERSCHEL, experiments on the conducting power for heat of certain rocks, 127
"Lectures on Light" (review), 98
Lectures upon systems of fire, burglar, and other alarms, 133
"Legal Responsibility in Old Age" (review), 400
LESPEYRES, artificial crystals of metallic antimony, 408
Life-history of monads, 273
Life, loss of at sea, 465
Lighthouse, Great Basses, 270
"Light, Lectures on" (review), 98
"Light Science for Leisure Hours" (review), 105
Lignites and American coals, age of, 406
"Limes, Hydraulic Cements, and Mortars, Practical Treatise on" (review), 112
List of projects for consideration at the Private Bill Office, 126
Livingstonite, mineral, 540
LOCKYER, J. N., "Spectroscope and its Applications" (review), 102
Loess, description of, 126
LOEWY, B., "Handbook of Natural Philosophy" (review), 531
"Long-Span Bridges" (review), 118
LUBBOCK, Sir J., "Origin and Metamorphoses of Insects" (review), 115
Luminiferous ether and atomic matter, 180
"Lunacy, Manual of" (review), 250
Lunar atmosphere and its influence on lunar questions, 492
LUTHY, R., valves suitable for working hydraulic machinery, 542

McCONNOCHIE, J., mechanical arrangement for shipping, 543
MACFARLANE, J., coloured tapers, 280
Machinery, coal-cutting, 262
MACKINTOSH, J., Iowa and Illinois tornado, 339
MACKENZIE, J., report on the coal fields of Victoria, 262
Magic lantern slides for geology, 417
Magnetic ore separation, 539
"Magnetism and Electricity" (review), 107
Maintenance and construction of Braye Bay harbour, 123
Manufacture of permanent beer, 280
"Manual of Lunacy" (review), 250
MAUNDER, S., "Treasury of Natural History" (review), 404
MARSHALL, W., "Phrenologist Amongst the Todas" (review), 204
MAT, M. DE, alarum signals, 419
Matériel, British artillery, recent changes in, 40
Mechanical puddling, advance of, 407
"Medical Electricity, Theoretical and Practical, and its Uses in the Treatment of Paralysis, Neuralgia, and other Diseases" (review), 117
MEDLICOTT, H. B., Narbada, or Satpura coal basin, 262
Memoir of the Caspian Sea, 127
"Merchant Ships and Ironclads" (review), 396
Metallurgy of bismuth, 408
Metals and minerals of Upper Burmah, 139
— elasticity of, 264
— tests of, 264
"Metamorphoses and Origin of Insects" (review), 115
Meteoric stone which fell at Barratta Station, 123
Method of converting cast-iron into malleable iron or steel, 122
— — preventing tampering with the Davy lamp, 262
— — recording barometric and thermometric observations, 119
MEYER, J. C. C., patent high-pressure boilers, 125
"Microscope, Evenings at" (review), 254
"Microscope, Half-Hours with the" (review), 253

Milk, composition and analysis of concentrated, 547
MILLER, W. A., "Elements of Chemistry" (review), 252
"Mind and Body: the Theories of their Relation" (review), 113
Mineral arsenides and sulphides, 123
— resources in Victoria, 406
— species of felspars, new, 265
Mineral statistics, 263
— — cause of delay in the publication of, 261
"Mineralogy" (review), 533
Minerals and metals of Upper Burmah, 139
Modern researches in tropical zoology, 320
— steel, nature and uses of, 122
MOJSISOVICS, Dr. VON, geological investigation of the neighbourhood of Hallstadt, 128
Molecular changes produced in iron by variations of temperature, 264
Monograph of minerals, 265
MONTEIRO, J. J., habits of the "plantain eaters," 132
Moon, past history of, 306
"Mortars, Hydraulic Cements, and Limes, Practical Treatise on" (review), 112
MORTON, C. H., condition of silicon in pig-iron, 408
"Mounting and Preparation of Microscopic Objects" (review), 252
Muræonsaurus, 415

NARBADA, or Satpura coal basin, 262
Native copper mines of Lake Superior, 162
Natro-metallurgy, a process for refining impure lead, 408
Natural compounds of tantalum and niobium, 266
"Natural History for Beginners" (review), 248
"Natural History, Treasury of" (review), 404
Nature and uses of modern steel, 122
Navigation, steam, 541
NEISON, EDMUND, the lunar atmosphere and its influence on lunar questions, 492
Nefediewite, 123
NELTHROPP, H. L., "Treatise on Watch-Work" (review), 259
NENDEL, G. W., guns, 411
NEWBERRY, J. S., age of American coals and lignites, 406
New alloy, 264
— Mexican mineral, 410
— mode of tempering steel, 122
— rock drill, 414
— safety-lamp, 120
NICHOLSON, H. A., "Natural History for Beginners" (review), 248
Nickel and coal in Persia, 406
Niobium and tantalum, the composition of the natural compounds of, 266
NÖGGERATH, M., phosphorescent glow of agates and other siliceous stones, 266
— production of light in grinding hard stones, 279
Note on tube boilers, 267
Notes of an enquiry into spiritualism, 77

OBJECT-GLASS of America, 274
Observations about brookite, 123
— on the optical phenomena of the atmosphere, 34
"Old Age, Legal Responsibility in" (review), 400
OLIVER, S. P., recent changes in British artillery matériel, 40
Opal, spectrum of, 266
Optical characters of the epidote of Sulzbach, 266
— phenomena of the atmosphere, observations on, 34
"Organic Chemistry, Introduction to" (review), 250
"Origin and Metamorphoses of Insects" (review), 115
Origin of lake basins, 271
— — the estuary of the Fleet, 127
"Our Ironclads and Merchant Ships" (review), 396
"Ozone and Antozone; their History and Origin" (review), 116

PADDON, J. B., Brighton and Hove gas-works, 268
Palæontology, 271, 415, 545
PAUL, M., improvement in photo-lithography, 280
Parish boundaries and geology, 271
Past history of our moon, 306
PASTEUR, M., manufacture of permanent beer, 280
PAYEN and ROUX, MM., natro-metallurgy, a process for refining impure lead, 408
Peat-bogs, 294
PENGELLY, W., flint and chert implements found in Kent's Cavern, near Torquay, 141

XUM

PERNOT, M., puddling furnace, 407
PERRY, J., "Elementary Treatise on Steam" (review), 395
Peruvian mineral, huantajayite, 410
PETTIGREW, J. B., "Animal Locomotion" (review), 237
PESLIN, M., elasticity of metals, 264
PHILLIPS, late Prof., 416
— T. A., "Elements of Metallurgy" (review). 534
Phosphor bronze, 121
Phosphorescent glow of agates and other siliceous stones, 266
Photo-lithography, improvement in, 280
"Phrenologist amongst the Todas" (review), 240
"Physics, Experimental and Applied, for the Use of Schools and Colleges" (review), 117
"Physiology, Animal" (review), 257
Physiology of the brain, and its reception, 56
PIERCE, W. T., "Practical Solid or Descriptive Geometry" (review), 397
Pig-iron, condition of silicon in, 408
PIRSCH-BAUDOIN, M., new alloy, 264
Pit-signalling, better communication in by means of electricity, 262
"PLATTNER'S Manual of Qualitative and Quantitative Analysis with the Blowpipe" (review), 531
Polar glaciation, 414
Pole star and the pointers, 285
PONTON, M., relation between refracted and diffracted spectra, 27
"Practical Solid or Descriptive Geometry" (review), 397
"Practical Treatise on Limes, Hydraulic Cements, and Mortars" (review), 112
Prazmowski, M., new helioscope, 545
"Preparation and Mounting of Microscopic Objects" (review), 252
Preparations in balsam, 273
Prevention of colliery accidents, 119
— — — explosions, 262
PRIDEAUX, T. S., on Gall's discovery of the physiology of the brain, and its reception, 56
"Principles of Mechanics" (review), 534
Process for testing the colour of wines, 280
PROCTOR, R. A., "Light Science for Leisure Hours" (review), 105
— past history of our moon, 306
— Saturnian system, 1
— "The Universe and the Coming Transits" (review), 528
Production and economical uses of fuel, 194
— of light in grinding hard stones, 279
"Proper Food of Man: Fruits and Farinacea" (review), 239
Proposed Channel tunnel, 272
Pseudomorphs, two kinds after rock-salt, 410
"Psychology, English Contemporary" (review), 236
Puddling furnace, 407
— mechanical, advance of, 407

"QUANTITATIVE Chemical Analysis" (review), 107
Quantity and value of minerals, summary of, 261

RAILWAY accidents, 413, 541
— between Wiveliscombe and Barnstaple, 126
— fixed signals, 414
RAMMELSBERG, M., chemistry of minerals, 410
— composition of the natural compounds of tantalum and niobium, 266
— mineral arsenides and sulphides, 123
Rapier, N. C., railway fixed signals, 414
Rare mineral, roselite, 266
RAMSEY, Mr., Rhine Valley, 415
RATH, study of asmanite, 265
Recent changes in British artillery matériel, 40
— extraordinary oscillations of the waters on Lake Ontario and on the sea-shores of Peru, Australia, Devonshire, &c., 156
Reception and physiology of the brain by Gall, 56
"Record of Science and Industry" (review), 398
Refracted and diffracted spectra, relation between, 27
Remarks on iron, 408
Report on boilers, 267
— — the coal-fields of Victoria, 262
Researches on alloys, especially those of copper and tin, 121
Results of analysis. 410
REYNOLDS, O., electricity, 278
Rhagite, a hydrous arsenate of bismuth, 410
Rheims, improvement of the sewage, 124
Rhine Valley, history of, 415
RIBOT, T., "Contemporary English Psychology" (review), 236

RICHE, A., researches on alloys, especially those of copper and tin, 121
RICHTER, Prof. TH., "PLATTNER'S Manual of Qualitative and Quantitative Analysis with the Blowpipe" (review), 531
RICHTHOFEN, Baron von, coal-fields in China, 120
— description of "loess," 126
Rivotite, mineral, 540
Rock drilling, 414
RODWELL, G. F., "Birth of Chemistry" (review), 251
RÖHRIG, Dr., and Mr. HAAS, iron ores in Bidasoa, 120
ROUX and PAYEN, natro-metallurgy, a process for refining impure lead, 408
RUTHERFORD, W., freezing microtome, 128
RUTLEY, F., "Mineralogy" (review), 533

SAELTZER, A., "Treatise on Acoustics in Connection with Ventilation, and an Account of the Modern and Ancient Methods of Heating and Ventilation" (review), 118
Sand blast, 273
"Sanitary Engineering" (review), 110
Satpura, or Narbada coal basin, 262
SCHEELE'S green, unhealthiness of rooms prepared with, 281
SCHRAUF, Dr., monograph of minerals, 265
— observations about Brookite, 123
SCHUNGEL, Dr., on sound, 280
"Science and Art, Year-Book of Facts in" (review), 403
"Science and Industry, Annual Record of" (review), 111, 398
"Science, Light, for Leisure Hours" (review), 105
SCOTT, R. H., method of recording barometric and thermometric observations, 119
Sea, loss of life at, 465
Sections, naphthalin for cutting, 130
SEELEY, muræousaurus, discovery of, 415
Sewage, improvement at Rheims, 124
SHELLEY, C. P. B., "Workshop Appliances" (review), 109
Ships, 412
— designs for, 412
Siberia, Steppes of, 545
Signals, 413
Silicon in pig-iron, 407
Siliceous stones and agates, phosphorescent glow shown by, 266
SIMPSON, J. B., coal-fields and mining industries of Russia, 538
SINGERLY, B., "Fourth Annual Report of the Board of Commissioners of Public Charities of the State of Pennsylvania" (review), 532
Slag for blast-furnace, utilising, 264
Slide, new syphon, 567
SMITH, C., distribution of spathic iron ores, 406
— J., "Fruits and Farinacea Proper Food of Man" (review), 239
SMYTH, R. B., mineral resources in Victoria, 406
— J., Upper Bann, 541
SNELUS, G. J., spiegeleisen, 407
SOKOLNICKI, Count, counterfeit wines, 280
Sound, source and velocity of, 280
Spathic iron ores, distribution of, 406
Specimen of glass from the American sand-blast, 130
Spectra, refracted and diffracted, relation between, 27
"Spectroscope and its Applications" (review), 102
Spectrum of the opal, 266
SPENCE, P., steam economy, 268
Spiegeleisen, 407
Spiritualism, notes of an inquiry into, 77
ST. CLAIR, G., "Darwinism and Design; or Creation by Evolution" (review), 229
Statistics in connection with the coal produce of England, 119
— mineral, 263
Steam economy, 268
— navigation, 541
"Steam, Elementary Treatise on" (review), 395
"Steel, Enquiry into the Mechanical Properties of" (review), 398
STELYNER, A., mineralogy, 409
STEVENS, A. J., application of compressed air to underground haulage, 120
STEWART, B., "Conservation of Energy" (review), 232
STOLICZKA, F., death of, 546
Street pavements, 268
Strength of boilers, 125
— of iron ships, 412
STROVER, G. A., metals and minerals of Upper Burmah, 139
"Students' Animal Physiology" (review), 257
Study of asmanite, 265
— of corundum, 265

Sub-Wealden exploration, 127, 272, 415, 545
Sulzbach, epidote of optical characters of the, 266
Summary of quantity and value of minerals of the United Kingdom during 1872, 261
Survey, Geological, of the United Kingdom, 52
Syngenite, description of, 266
System, Saturnian, 1

TANTALUM and niobium, the composition of the natural compounds of, 266
Tapers, coloured, 280
"Telegraphy, Handbook of" (review), 255
Temperature, variations in molecular changes produced in iron, 264
Tempering steel, new mode of, 122
Tests of metals, 264
Thanet sand on the northern outcrop of the London basin, 128
"The Ocean" (review), 246
"Theory of Arches" (review), 531
Thermometric and barometric observations, method of recording, 119
THOMPSON, JAMES, Prof., steam navigation, 541
THOMSON, WM., Sir, deep-sea sounding, 541
THORPE, T. E., "Quantitative Chemical Analysis" (review), 107
THURSTON, R. H., molecular changes produced in iron by variations of temperature, 264
Tietze coal and nickel ore in Persia, 406
Tin trade and tin production, 539
TOPLEY, Mr., Geology and parish boundaries, 271
Torbenite, 123
Trains, intervals between, 413
"Transactions of the American Institute of Mining Engineers" (review), 407
"Treasury of Natural History" (review), 404
"Treatise on Watch-Work" (review), 259
Trimerellidæ, 415
Tropical Zoology, modern researches in, 320
Tube-boilers, note on, 267
TYNDALL, J., "Lectures on Light" (review), 98

UNHEALTHINESS of rooms papered with Scheele's green, 281
United Kingdom, Geological Survey of, 52
"United States Commission on Fish and Fisheries" (review), 405
"Universe and the Coming Transits" (review), 528
Uranic acetate (normal), 135
Useful displacement as limited by weight of structure and of propulsive power, 412
Utilising blast-furnace slag, 264

VALENCIENNES, A., metallurgy of bismuth, 408
Value and quantity of minerals, summary of, 261
Valves suitable for working hydraulic machinery, 542
Veszelite, mineral, 540
Victoria coal-fields, 538
— — report on, 262
— gold-fields of, 539
Volcanic eruption and earthquake at Nissiros, 127
Voltameters, result of experiments with, 132

WAGON drop, new form of, for blast-furnaces, 543
WARD. J. C., origin of lake basins, 271
"Watch-work" (review), 259
Water-basin of Lough Derg, 127
Water supply, improvement of Paris, 124
— — of Deptford, 267
— — of Dublin, 269
Wax, Japan, 248
WEBB, W., dispute about fine lines on Nobert's test-plate, 131
WEBSKY, M., Grochauite, new species of clinochlore, 410
Weight of structure and of propulsive power, useful displacement as limited by, 412
WEST, CHAS., "The Harveian Oration for 1874" (review), 522
Whistle for locomotives wrought by electro-magnet, 419
WHITAKER, W., discovery of Thanet sand on the northern outcrop of the London basin, 128
— — geological block model of London, 127
— — lists of papers on Geology, Mineralogy, and Palæontology, 271
Wines, counterfeit, 280
— process for testing the colour of, 280

WINSLOW, L. S., "Manual of Lunacy" (review), 250
WOOD, Mr., utilising blast-furnace slag, 264
WOODWARD, C. J., improved forms of gas generator, 139
— H., Palæontology, 371
Working coal-cutting machinery in mines, 119
"Workshop Appliances" (review), 109
WRIGHTSON, T., new form of wagon drop for blast-furnaces, 543
WÜRZBURGER, P., Geology of West Coast iron districts, 537

"YEAR-BOOK of Facts in Science and Art" (review), 403

ZEPHAROVICH, M., description of syngenite, 266

LIST OF PLATES AND WOODCUTS IN VOLUME IV. (N.S.)

	PAGE
Optical Phenomena of the Atmosphere	37
New Freezing Microtome (2 *figures*)	129
Spectrum of Feathers of the "Plantain Eaters"	132
Fluorescent and Absorption Spectra of the Uranium Salts (9 *figures*)	135
Vessel for Extraction of Sulphur	139
Improved Forms of Gas Generator (2 *figures*)	140
The Native Copper of Lake Superior	141
Deep Sea Thermometer	277
The Pole Star and the Pointers (6 *figures*)	287
Peat Bogs	298
The Iowa and Illinois Tornado (24 *figures*)	339
Loss of Life at Sea (3 *figures*)	465
Curved Appearance of Comets' Tails	508

ERRATA.

Page 378, line 1, *read* "motions of the upper currents and of the heavy masses."

Page 383, line 17 from bottom, *read* "It was at this point within 1½ miles of Iowa River, the course of which is here nearly parallel with that of the tornado. The crookedness," &c.

Page 394, line 13, *for* "Smithsonian Institute of Warsaw and Illinois," *read* "Smithsonian Institute, Warsaw, Illinois."